

Precalc. BC 3-D and Quadric

Name _____

1. If $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 1$ is an equation of the plane containing points $(-1,2,-3)$; $(1,0,3)$; and $(2,0,0)$, then the product abc equals
a) 1 b) -4 c) -9 d) 9 e) 12

2. The graph of $x^2 + 4y^2 = z^2$ is
a) an ellipsoid b) a sphere c) an elliptic cone
d) 1-sheet hyperboloid e) 2-sheet hyperboloid

3. The graph of $x^2 - 4y^2 + z = 1$ is a(n)
a) elliptic paraboloid b) hyperbolic paraboloid
c) 1-sheet hyperboloid d) 2-sheet hyperboloid
e) pyramid

4. If the two vectors $u \langle 3, 5, -1 \rangle$ and $v \langle 1, -2, t \rangle$ are perpendicular, then t equals
a) 0 b) 1 c) -7 d) 12 e) 13

5. The intersection of $x^2 + 4y^2 - z = 1$ with a plane could **not** be
a) an ellipse b) a point c) a parabola
d) a hyperbola e) the empty set

6. In three dimensions what is the set of all points for which $x = 0$?
a) the origin b) the yz -plane c) the x -axis
d) a line parallel to the x -axis
e) a plane containing the x -axis

7. The plane $ax + by + cz = 12$ has intercepts at $(2,0,0)$, $(0,-3,0)$ and $(0,0,-4)$. $a + b + c =$
a) 13 b) 7 c) 6 d) 0 e) -1

8. A line, m , is parallel to a plane, X , and is 6 inches from X . The set of points that are 6 inches from m and 1 inch from X form
a) a line parallel to m b) one point
c) two lines parallel to m d) the empty set
e) four lines parallel to m

9. What is the length of the radius of the sphere with equation $x^2 + y^2 + z^2 - 4x - 5y + 6z = 0$?
a) 6.75 b) 4.39 d) 2.60
d) 19.25 e) 3.46

10. The plane whose equation is $2x + 3y + 5z = 35$ forms a pyramid in the first octant with the coordinate planes. Its volume is
a) 190.6 b) 238.2 c) 285.8
d) 381.1 e) 566.8

11. If a square prism is inscribed in a right circular cylinder of radius 4 and height 10, the total surface area of the prism is closest to
a) 192 b) 88 c) 226 d) 290 e) 320

12. A cube is inscribed in a sphere, and a smaller sphere is inscribed in the cube. What is the ratio of the volume of the small sphere to the volume of the large sphere?
a) 0.50 : 1 b) 0.33 : 1 c) 0.58 : 1
d) 0.19 : 1 e) 0.71 : 1

13. The line passing through $(1,4,-2)$ and $(2,1,4)$ can be represented by the equation
a) $(-1 + 2t, 3 + t, 2 + 4t)$ b) $(1 + 2t, 4 + t, -2 + 4t)$
c) $(2 + t, 1 + 4t, 4 - 2t)$ d) $(1 + t, 4 - 3t, -2 + 6t)$
e) $(1 - t, -3 - 4t, 2 + 2t)$